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THE QUEBEC-WINDSOR RAIL CORRIDOR:

A WORKING PAPER

Ontario Ministry of Treasury and Economics

Ontario Ministry of Transportation and Communications

November 1978

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SUMMARY

Opportunities for Investment

- A proposal to accelerate the modernization of Canada's rail facilities was advanced by the Premier of Ontario at the Federal-Provincial Conference of First Ministers held in February 1978.

- 125 mph service on an exclusive passenger track should be the goal in the Quebec-Windsor corridor. A first-step package of improvements offering service at 95 mph could cost some $250 million.

- The keys to cost-effective upgrading are: investing in routes where the pay-off in increased passenger volumes will be the greatest; getting the most capacity out of existing infrastructure; and, rejecting "gold-plated" solutions in favour of practical, less costly approaches.

Immediate Benefits - Job Creation

- An expenditure of $250 million could create approximately 1,200 jobs for each of five years. These jobs would be in such areas as: upgrading track, reballasting, and improvements to curvature, signalling and terminals.

- Secondary jobs would be created in supplier industries -- primary metals (e.g., rails, reinforcing bars), fabricated metals, electronics, and cement and concrete products.

- Rail orders which would result from acceleration of rail improvement programs could be filled in Canada by Canadian-owned companies.

- If further orders for LRC trains were to be triggered by improvements to infrastructure, additional jobs would be created in rolling stock and locomotive manufacturing industries, as well as in supplier industries such as iron and steel, aluminum fabrication and glass.

Long-Term Benefits

- Rail improvement would assist rail freight traffic to attain improved speed, efficiency, customer service, labour productivity and safety, allowing it to capture a balanced market share, particularly with respect to container traffic.

- An improved rail service would increase the availability of affordable transportation to a wide segment of the population.

- An improved rail service, attracting new passengers, would facilitate rational long-term investment decisions for all passenger modes.

- An exclusive passenger track could help to eliminate:

  - freight interference, thereby speeding up both passenger and freight operations;

  - risk of collision between passenger and freight trains;

  - deterioration of improved track by heavy freight trains.

Passenger Volumes

- After many years during which ridership and services were declining, rail travel is experiencing a revival.

- Passenger volumes in all regions across Canada are on the rise. Ridership across the CN system was up ten per cent in 1977, with the most dramatic increase in the Quebec-Windsor corridor. These gains are remarkable as they have occurred in spite of a lack of investment in capital stock and strong competition from other modes.

- Studies of the Toronto-Windsor route have indicated that 95 mph service could attract a substantial increase in ridership and contribute to reductions in annual operating subsidies.

- With 95 mph service and promotion of the rail mode, in addition to the normal growth in demand, rail patronage three to four times current levels could be a realistic target in the Quebec-Windsor corridor over the next 10-15 years.

Financial Considerations

- The roles of the various organizations engaged in providing rail passenger services are complex and overlapping.

- The federal government spends almost half its transportation funds on air: over the last six fiscal years only 26 per cent has been spent on rail, most of this to subsidize losses rather than to improve infrastructure.

- Bill C-17 recently converted to equity $808 million of CN's debt held by the federal government. This represents about 40 per cent of total debt and is expected to help turn CN's history of losses into profits.

- In 1952, a similar recapitalization bill released CN from $736 million of debt, or 50 per cent of total debt. By 1976, CN's debt had risen to $2.2 billion. VIA will, in effect, take over the losses associated with the provision of passenger services.

Performance of Rail Service

- The average speed of the Turbo train between Toronto and Montreal has dropped from 82 mph to 74 mph. Turbo time is now only 20 minutes faster than the fastest conventional train -- the Rapido.

- The transcontinental is often three hours late arriving from the east and five hours late arriving from the west. In the late 1960's the transcontinental service took almost a full day less than the current three and one-half days.

- Based on comparisons with other countries, it would appear that Canadian rail safety could be improved.

- If some LRC equipment now under production is not deployed in the corridor, severe shortages of modern passenger equipment will result in Southwestern Ontario, especially in peak periods.

The initiatives proposed in this paper are aimed at improving the speed, reliability and safety of the Canadian rail system. These initiatives would have the benefits of creating short-term jobs and at the same time improving the long-term productivity and efficiency of both passenger and freight movement.

INTRODUCTION

A proposal to accelerate the modernization of Canada's rail facilities was advanced by the Premier of Ontario at the Federal-Provincial Conference of First Ministers held in February 1978. Premier Davis recommended that all regions across Canada should be considered as candidates for increased rail investment. This action would combine the benefits of new jobs in the short term with a long-term improvement to the productivity and efficiency of passenger and freight movement.

The Canadian rail system is at a critical point in its history. After many years, during which ridership and services were declining, rail travel is experiencing a revival. Passenger volumes in all regions of Canada are on the rise. A program of modernization is urgently required to respond to the Canadian public's renewed interest in travelling by rail. The key to revitalizing Canada's rail system is to invest in those facilities that will increase the performance of rail passenger services while offering simultaneous benefits for freight.

The purpose of this paper is to provide further background to the Premier's call for an accelerated rail modernization program. The paper has four objectives. First, it reviews the current condition of rail infrastrucure in Canada and identifies a number of problem areas. Second, rail improvement programs promised by the federal government are contrasted with actual programs underway. Third, opportunities for improvement in the Quebec-Windsor corridor are evaluated. Finally, the paper reviews the financial and economic considerations involved in additional rail expenditures.

CURRENT SITUATION

Passenger Traffic

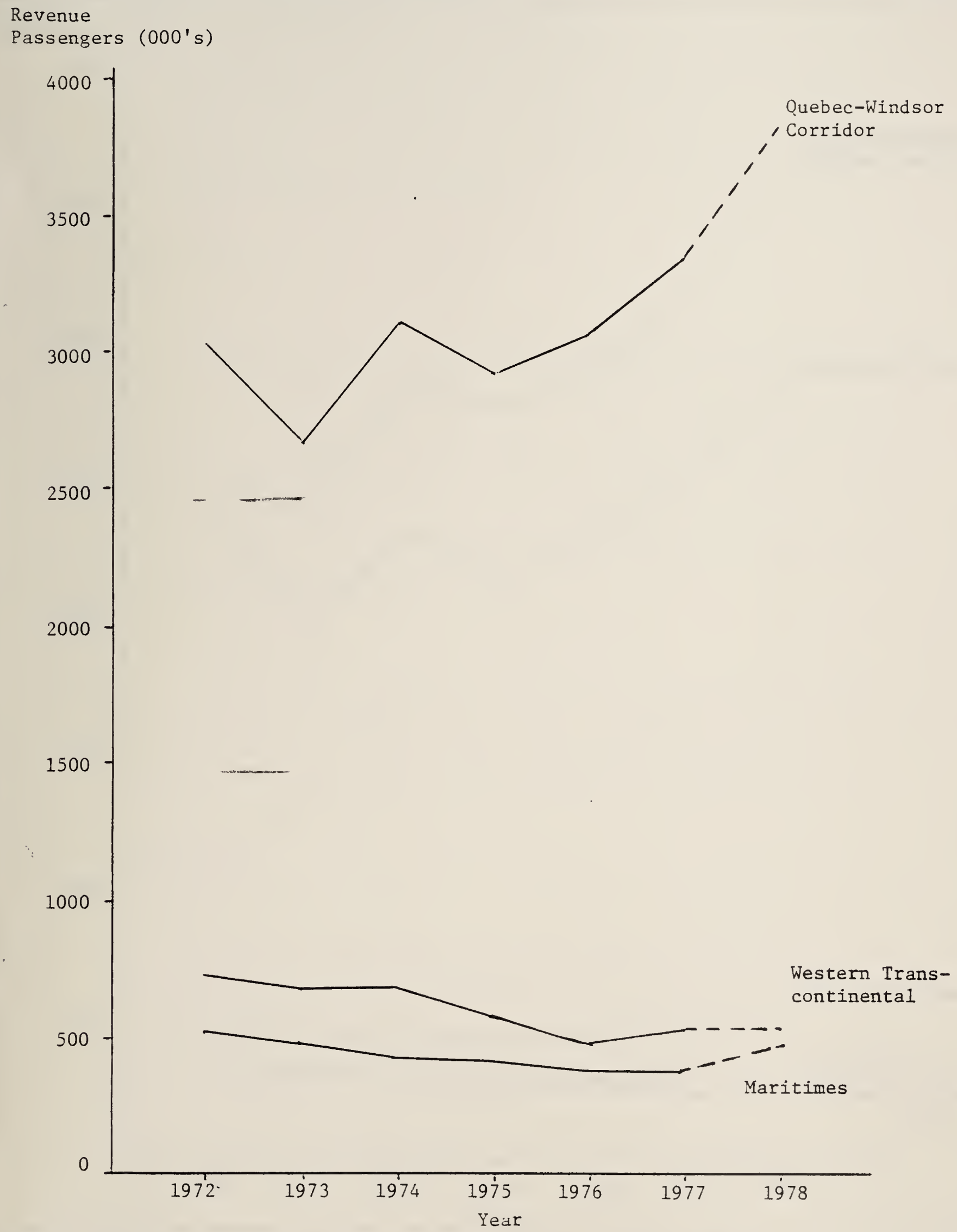
Over the last few years, patronage of the passenger rail system has been increasing across Canada. VIA's annual report for 1977 notes that passenger traffic across the CN system was up ten per cent in 1977 over 1976, with all regions sharing in the increase. The gains in Canada's rail passenger volumes since 1975 are recorded in Figure 1. They are remarkable as they have occurred in spite of a lack of investment in capital stock and strong competition from other modes.

Although all regions have experienced increases, the most dramatic have been in the Quebec-Windsor corridor. Figure 2 indicates that most corridor routes have been increasing steadily since 1975. Even the Toronto-Ottawa route, which is handicapped by a six-hour trip time and substandard track in the Ottawa-Brockville section, has participated in the increase.

Equipment

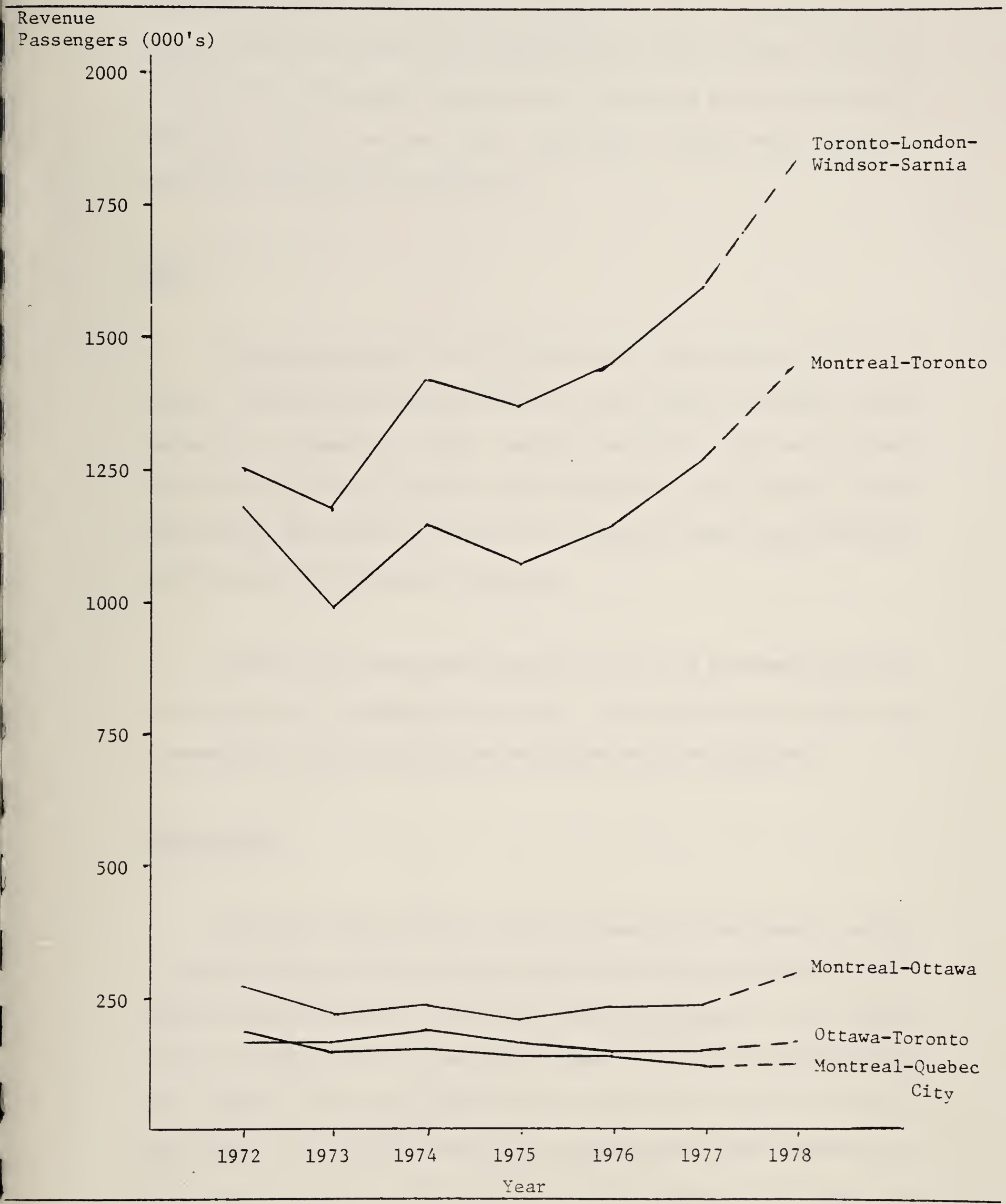
Modern passenger rail equipment is in short supply across Canada. While transcontinental service is now part of VIA's improvement efforts, CN cut back its part of this service in 1976, from two trains per day to one train per day, partly because of passenger car disrepair and lack of replacement cars. The shortage is now particularly serious in Southwestern Ontario, where large numbers of old rail cars are still in service. As passenger volumes continue to grow, this shortage will become more acute.

CN REVENUE PASSENGERS, CANADA — Figure 1



NOTE: 1. 1973 volumes reduced by a nation-wide rail strike during August.
2. 1978 estimates based on performance during first nine months of 1978.
Source: Canadian National Railways.

CN REVENUE PASSENGERS, QUEBEC-WINDSOR CORRIDOR — Figure 2



NOTE: 1. 1973 volumes reduced by a nation-wide rail strike during August.
2. 1978 estimates based on performance during first nine months of 1978.

Source: Canadian National Railways.

The last major purchase of rail passenger cars was in 1954. Although some newer equipment (Turbo, Tempo, Rapido) is in use in the Quebec-Windsor corridor, most cars in service across Canada date from 1954 or earlier. Even cars built as early as 1937 are still operating. Over 100 coaches with ice-activated air conditioning are in service today, particularly during peak periods in Southwestern Ontario and the Maritimes.

Track

Although advances in track construction, such as concrete ties and concrete slab beds are being introduced in some areas of Canada, further improvement is possible. Frost heaving, the heavy axle load of diesel locomotives and the high volume of heavy freight trains all contribute to track deterioration. The result is a reduction in average train speeds that makes high-speed passenger service difficult to achieve.

Current "cycle" maintenance practices can have a detrimental effect on the performance of passenger rail services. An alteration of procedure and implementation of more sophisticated techniques should be undertaken.

Traffic Control

Centralized Traffic Control (CTC) is necessary for two reasons -- safety, as a train travelling at 90 mph requires two miles to stop, and efficiency, as it permits optimum spacing of trains and maximized capacity of the railway system. In Canada, CTC is in operation on about 60 per cent of the high-density lines. However, this technique still relies on train crews responding to wayside block signals. CTC can be improved by automating both central signalling and train response to signals. The need for improved signalling will become even more urgent as more high-speed passenger trains are introduced.

A continuing problem on several Quebec-Windsor corridor routes is the lack of modern switching between sections of line. On the Toronto-Ottawa route, for example, manual switches must be operated at Smiths Falls and Brockville, requiring at least three extra stops and increasing the travel time.

Grade Crossings

Too many level crossings still exist on main rail lines in Canada. The failure to separate rail from road traffic, especially in populated areas, can lead to serious accidents. In addition to improving safety, isolating rail from road traffic where needed would assist trains to increase their average speeds and efficiency to levels necessary to attract an increased share of the passenger market.

Quality of Service

One result of deteriorated rail infrastructure, some maintenance practices and increasing track congestion has been a decline in the quality of passenger service in Canada. Two of the most important measures of service quality are speed and reliability. The Canadian passenger rail system has problems in both areas. Even in the Quebec-Windsor corridor, the speed of service is dropping. Table 1 indicates that the average speed of the Turbo train between Toronto and Montreal has dropped from 82 mph to 74 mph. CN has progressively lengthened the Turbo journey time from 3:59 to 4:10 to 4:15, and in April 1977, to 4:30/4:35. Turbo time is now only 20 minutes faster than the fastest conventional train -- the Rapido.

CANADIAN NATIONAL SCHEDULED TRAIN SPEEDS (mph) Table 1

		1960	1965	1970	1978
Montreal to Vancouver	(2,924 mi.)	41.9	43.0	42.4	34.2
Montreal to Halifax	(840 mi.)	36.5	39.1	40.5	40.2
Montreal to Quebec	(167 mi.)	40.9	46.3	55.7	61.7
Montreal to Ottawa	(118 mi.)	51.8	54.5	54.4	53.7
Montreal to Toronto	(335 mi.)	45.0	52.5		
- Rapido				64.8	66.9
- Turbo				82.0	73.7
Toronto to Windsor	(228 mi.)	36.0	52.6	52.6	54.3
Toronto to Sarnia	(174 mi.)	42.7	45.0	43.1	50.6

Source: Canadian National Railways Timetables

In Western Canada as well there are problems with speed and reliability. Reportedly, the transcontinental is often three hours late arriving from the east and five hours late arriving from the west. In addition the transcontinental service between Montreal and Vancouver took almost a full day less in the late 1960's than the current three and one-half days.

Safety

Compared to other modes of travel in Canada, rail is one of the safest. However, the current state of rail traffic control, communications, grade crossings and infrastructure have significant effects not only on efficiency but also on safety.

Rail safety comparisons with other countries produce mixed results: the Canadian record compares favourably with that of the United States but not with those of Western Europe. Although data are not strictly comparable because of differences in terrain and climate and because European rail services generally separate passenger and freight movement, a comparison of Canadian and French rail accident data (adjusted for number of train-kilometers) reveals that Canadian railways in 1973 experienced 12 times the number of derailments, three times the number of collisions, and twice the number of passenger deaths as French railways. Moreover, the Japanese have safety records much better than the French.

Lack of guaranteed train response to signals has been the cause of several serious rail accidents in Canada in recent years. An example can be cited involving freight and passenger trains in the Quebec-Windsor corridor. On December 20, 1974, a CN passenger train smashed head on into a freight train near Kingston, killing three people and injuring about 50.

While there is not a high frequency of crossing accidents, failure to separate road from rail traffic has also resulted in serious incidents when they do occur. Two examples can be cited on the Toronto-Montreal main line. On December 10, 1968, while making its inaugural press run, the Turbo train sliced a transport truck in half at a level crossing in Kingston, Ontario. On December 12, 1975, eight people were killed and 21 seriously injured in a train-bus collision in Scarborough, Ontario. Prior to the accident, Metro Toronto had unsuccesfully applied to the federal government for grade separations at the site.

PROMISED FEDERAL ASSISTANCE

High-Speed Service

Canada's existing rail passenger system is very different from the one the federal government promised in its 1974 re-election campaign. At that time, the federal government promised fundamental improvements in the passenger system. These improvements were to take place in three phases:

- Phase I -- the creation of a national passenger rail corporation (now exists as VIA Rail) and upgrading of existing services.

- Phase II -- high-speed trains such as the LRC (light, rapid, comfortable) come into operation. Phases I and II were to see investment of $500 million over 5 years, with the bulk of the expenditure in Phase I.

- Phase III -- a new era of high-speed passenger rail service would be inaugurated. Trains were to move at 150 mph with no level crossings. Cost estimates were not provided for Phase III, which was to occur between 1981 and 1984.

This entire program has subsequently been scaled down, so that the basic improvements called for in Phase I may now take as long as ten years to implement.

Union Station

Toronto's Union Station is the principal rail passenger facility in the city. Both the station and track approaches to the station are in need of substantial upgrading to cope with current volumes of traffic. Commuter, intercity passenger, and freight traffic congest the rail corridor, causing delays and additional costs.

Estimates prepared in 1976 suggested that $58 million would be required to correct the situation. After long negotiation Transport Canada recognized its responsibility for a portion of these improvements and agreed to contribute $16.5 million. The federal government has since backed down and refused to commit any funds to this project. As a stop-gap measure, the Ontario government will be investing $38 million without federal assistance in support of commuter rail services.

Further improvements, which are essential to increase capacity for intercity as well as commuter services, would now cost a minimum of $27 million. No portion of this amount has seen federal approval.

Grade Crossings

The Urban Transportation Assistance Program (UTAP), announced by the federal government in 1977, allocates too few funds to too many types of required projects. Ontario and several other provinces are affected. From Ontario's point of view, UTAP represents not a new program, but a reduced federal involvement in grade separations.

Since reduction in the number of level crossings is essential to achieve increased rail speeds, reduced federal spending in this area does not support rail improvement aims.

LRC Equipment

In 1976 the federal Minister of Transport announced that ten LRC trains would be purchased for use in the Quebec-Windsor corridor and committed seven of these to the Toronto-Windsor rail improvement program. There are now indications that these train sets may be deployed to services outside Ontario. The loss of these trains from Southwestern Ontario service will result in very severe shortages of modern passenger equipment, especially in peak periods. In all corridors in Canada where passenger rail service is deemed to be an appropriate transportation alternative, modern and efficient equipment should be made available.

LRC coaches feature powered banking which enables them to tilt, maintaining passenger comfort on curves. The coaches are capable of rounding curves at speeds 35 to 45 per cent faster than conventional coaches but of the 22 locomotives ordered by the federal government, only one will be capable of 125 mph service as constructed. The rest would be capable of such speed only with modification, without which they are not greatly superior to existing power units. In some ways LRC engines compare unfavourably with Turbo engines which, with a few modifications, would be capable of speeds well in excess of 125 mph.

EXISTING IMPROVEMENT PROGRAMS

Montreal-Quebec City Demonstration Service

In May 1976, Transport Canada announced plans to improve rail passenger service between Montreal and Quebec City. The CP line was selected for improvement. A total of $24 million was originally allocated to be spent on infrastructure over a three-year period, with construction scheduled for completion by the summer of 1979. Improvements were to include reducing track curvature, laying improved rail and upgrading signals and maintenance facilities. In addition, three LRC trains have been earmarked for this demonstration.

Cut-backs and delays have altered these plans. The budget has been recently cut to $13 million. Construction improvements cannot be completed by summer 1979. The LRC trains scheduled to begin service in May 1980 may not carry their first passenger until up to a year later.

It is possible that upgrading the CP line will not result in significant speed improvements over the time of 2:40 currently scheduled on CN. In addition, because the Quebec City rail station has been relocated to Ste-Foy on the outskirts of the city, the train is at a disadvantage in attracting passengers away from other transportation modes.

The Montreal-Quebec City demonstration service is unlikely to be a representative demonstration of the potential of an improved rail service. It is attempting to penetrate a difficult market with unique characteristics. If Canada is to have a meaningful demonstration of passenger rail's capability, improvements must be extended to the Montreal-Windsor portion of the corridor.

Montreal-Ottawa Improvements

VIA plans to upgrade the CP line to 95 mph service between Montreal and Ottawa at a cost of about $10 million. The CP line offers several advantages that will keep costs down:

- there is no freight traffic;
- track alignment is good for 95 mph;
- grade crossings are not seen as a major problem.

This Montreal-Ottawa upgrading, in effect, extends the Quebec City-Montreal demonstration service to Ottawa. LRC trains allocated to the demonstration service should be cycled between Quebec City and Ottawa, permitting more efficient use of the new equipment. The Montreal-Ottawa route could be suitable for a 125 mph test section which should increase knowledge of track design, making such speeds more readily achievable in other areas of Canada.

Toronto-Windsor Improvements

In May 1976, Transport Canada announced plans to make the Toronto-Windsor corridor a demonstration service, second in priority to the Quebec City-Montreal upgrading.

While no confirmation of implementation date has been forthcoming, considerable work has been undertaken with respect to feasibility and marketability of a 95 mph service. Studies have indicated that the significant travel time saving achieved through higher operating speeds and modern rolling stock could attract a substantial increase in ridership and contribute to reductions in annual operating subsidies. Implementation costs will depend on the modifications required to maintain an appropriate level of freight service in the corridor.

Since the 1976 announcement the "demonstration service" concept has been downgraded to a "rail improvement program" and no action toward implementation is evident.

Equipment

Transport Canada and VIA Rail have announced two programs aimed at improving the quality of passenger equipment in Canada. First, ten LRC trains will be purchased and deployed across Canada. The new equipment will cost $90 million. The trains will be built by a consortium of three Canadian firms -- Bombardier-MLW Ltd., Alcan Canada Products Limited and Dominion Foundries and Steel Limited. The first trains are due for delivery in 1980.

Second, about 100 rail diesel cars will be modernized. These self-propelled coaches are currently powered by truck engines that create noise and vibration in the passenger compartment. Modernization will consist of fitting new engines capable of 95 mph speeds and of refurbishing interiors. The program will require four to six years and entails an investment of $500,000 per car, for a total of $50 million. Deployment of the modernized coaches has yet to be announced.

Capital Cost Allowance

The First Ministers' Conference of February 1978 recommended that current programs to modernize Canada's rail facilities be accelerated. The federal government responded by including in their April 1978 Budget more favourable capital cost allowance provisions for railways. An additional straight-line capital cost allowance of 6 per cent will be provided on all railway system assets acquired after April 10, 1978 and before 1983. This additional allowance will be available in the year of investment and in each of the four subsequent years.

This concession is unlikely to have a substantial impact on the railways. The total tax saving (to CPR and some smaller lines) is estimated at about $5 million in the first year of the program, a sum which appears insignificant against CPR's existing asset base of approximately $5 billion. CN is not sufficiently profitable at present to benefit from the additional allowances.

OPPORTUNITIES FOR IMPROVED SERVICE: QUEBEC-WINDSOR CORRIDOR

125 mph Service on Exclusive Passenger Track

Heavy passenger volumes in the Quebec-Windsor corridor reflect the region's concentration of population and business activity. In the 715-mile belt joining the two cities are focussed more than half of Canada's population plus over 60 per cent of GNP. Market density, high income levels and substantial business travel make the corridor a prime candidate for testing the capabilities of high-speed rail service.

Rail improvement in the Quebec-Windsor corridor should be aimed at providing 125 mph service. As a first step, service should be upgraded to 95 mph.

Reduced travel times achieved through operating speeds of 95 mph and higher, in conjunction with proper infrastructure, rolling stock and promotion, could increase the ridership in the corridor substantially above what is experienced under existing conditions. In view of recent growth, rail patronage in the order of three to four times current levels could be a realistic target.

As speeds are increased beyond 95 mph, an exclusive passenger track becomes desirable, and beyond a certain speed, absolutely necessary. Where this point is reached on particular routes requires further investigation. In general, to exceed average speeds of 95 mph will require substantial investment in new track.

An exclusive passenger track would create significant opportunities to:

- eliminate freight interference, thereby speeding up both passenger and freight operations;
- eliminate deterioration of improved track by heavy freight trains;
- minimize risk of collision between passenger and freight trains, increasing rail safety;
- improve service and efficiency of both passenger and freight transport.

An exclusive track could be arrived at by several methods:

- doubling passenger track on existing rights-of-way;
- co-ordinated use of existing track of both CN and CP to create a double passenger line and a double freight line, where operationally and economically feasible;
- constructing track on new rights-of-way;
- a combination of these methods.

Toronto-Ottawa

While the potential for significant increases in rail travel exists on all routes in the Quebec-Windsor corridor, potential is perhaps greater on the Toronto-Ottawa route than on other portions of the corridor. It has the second lowest passenger volumes of all routes in the Quebec-Windsor corridor (Figure 2). It has the lowest average train speed (46.8 mph) of all routes in the corridor (Table 1). Its share of the Toronto-Ottawa travel market is the second-lowest rail modal share in the corridor (Figure 3). Had rail fared as well in the competition for passengers on the Toronto-Ottawa route as it did on the Toronto-Montreal route, it would have carried more than four times as many passengers as it currently does.

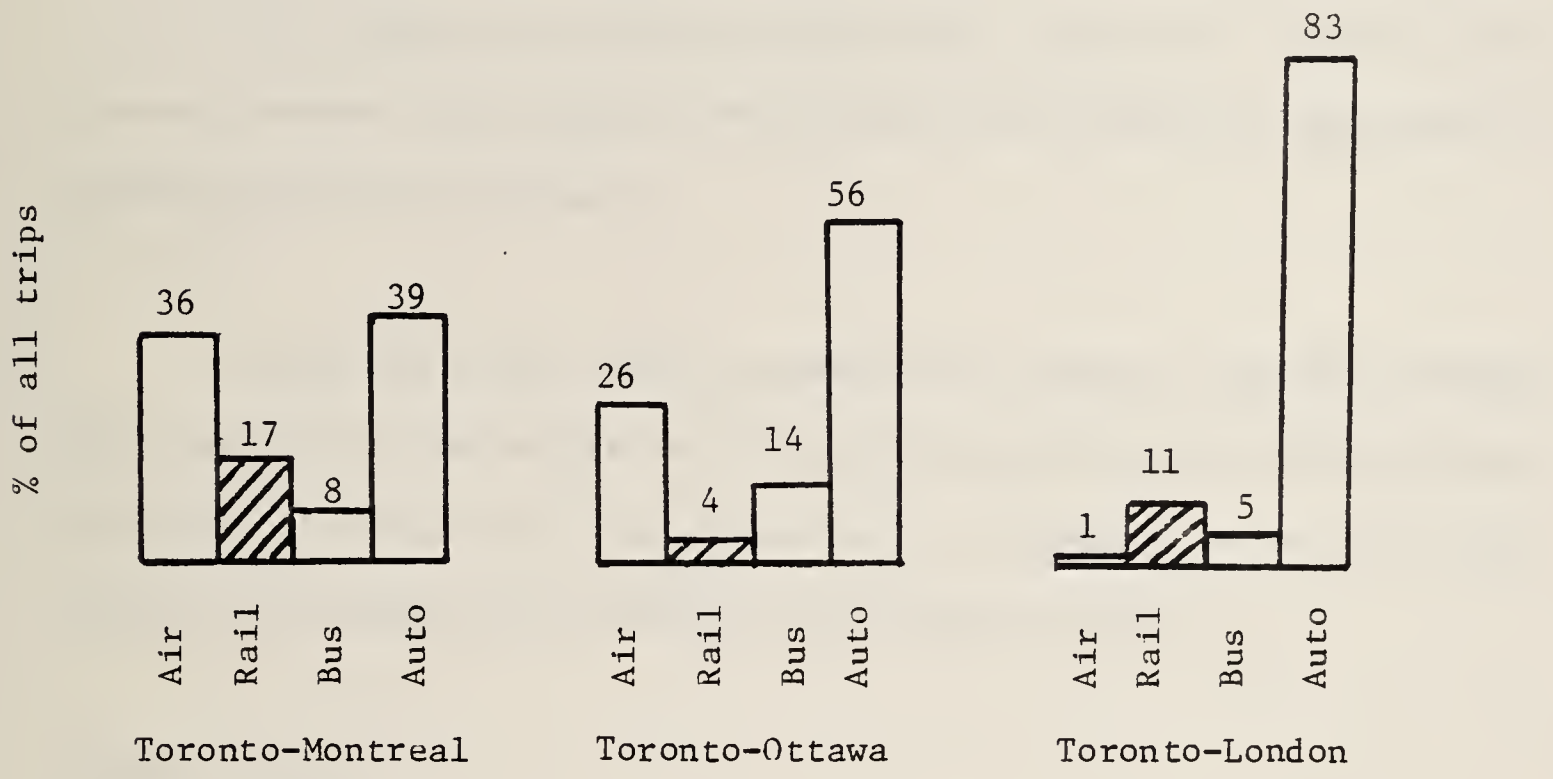
The condition of the track between Ottawa and Toronto varies widely. Some sections now provide only 40 mph service while others can sustain 95 mph but suffer from reduced speeds because of freight interference. An upgraded Ottawa-Toronto route would create an alternative solution to improved Montreal-Toronto services, as well as providing improved Ottawa connections. This would add only a few minutes to travel time compared to a through Montreal-Toronto route and would provide additional benefits.

Benefits of cycling trains between Montreal and Toronto through Ottawa include:

- one set of equipment is cycled instead of three sets, leading to cost savings;
- increased passenger volumes would reduce operating deficits;
- main line service would be extended to Ottawa passengers;
- increased frequency of trains would be possible, providing improved service to all passengers;
- potential reductions in the high air volumes between Toronto and both Montreal and Ottawa could be achieved, with corresponding reduction in pressure on Toronto International Airport.

Any new track alignment between Toronto and Ottawa should pass through Kingston, in order to reinforce its role as a major development centre in Eastern Ontario. Communities between Kingston and Montreal could under this alternative be served by rail diesel cars feeding into the high-speed service at Kingston and Montreal.

MODAL SPLIT, QUEBEC-WINDSOR CORRIDOR, 1976 Figure 3



Source: Estimates of Ontario Ministry of Transportation and Communications.

Traffic Control

The railways have been implementing centralized traffic control systems; however, this program is not complete, and presents an opportunity for federal government investment.

Centralized traffic control increases track capacity, thereby increasing the productivity of locomotives and rolling stock, achieving more efficient labour utilization and improving customer service by reducing delays in travel time. These benefits apply to both passenger and freight operations.

Grade Crossings

Additional grade separations are essential for high-speed rail service. A plan should be prepared with VIA and the Province outlining those grade separations required to implement both 95 mph and 125 mph service. In addition, the federal government should immediately review its UTAP program to allocate a realistic level of expenditure to grade separations across the country.

Ontario is prepared to explore a shift in some of its expenditure priorities over the next two years to complement any shift of federal government expenditure priorities into grade separations.

Union Station

Both intercity and commuter rail services are slowed by congestion on the track approaches to Union Station. Current estimates suggest that $65 million would be required to upgrade both the station and track approaches.

In addition to the $38 million currently being spent by Ontario, further improvements requiring investment of $27 million are essential to increase capacity for intercity as well as commuter services. The federal government should re-evaluate its position and invest in Union Station.

Equipment

There may soon be critical shortages of modernized passenger rail equipment if current travel trends continue. Additional LRC equipment is required to eliminate the shortages, reduce trip times and assist in attracting new passengers. LRC trains (at $7 million per set) should be ordered to ensure that those previously committed to the Toronto-Windsor rail improvement program indeed will be deployed in that area.

Research and Development

Rail research in Canada should concentrate on adapting advanced rail technology to suit Canadian conditions. These conditions include vast distances, relatively low population densities, difficult terrain and severe frost heaving. They critically affect the cost of providing and maintaining the good track alignment needed for passenger comfort, marketable speeds and freedom from derailment.

Research and development funds could be invested to advantage in railbed design, construction and maintenance, and locomotive and rolling stock design and operations. The following projects merit investigation:

Roadbed and Track:

- the most economical ways of reducing track distortion caused by heavy loads and frost heaving.
- the further application in Canada of Japanese and European automated equipment for ballast removal, track replacement and roadbed maintenance.
- operations research to maximize the capacity of existing infrastructure, including the testing of various freight and passenger train mixes, speeds, schedules, siding and double track locations.

Equipment:

- development of freight cars and locomotives with lighter axle weights to reduce rail distortion and replacement.
- development of rail passenger car suspension systems that can accommodate track imperfections.

Initiatives in rail research and development would reflect recommendations of the First Ministers' Conference of February 1978. They would also be consistent with the April 1978 federal budget.

Intermodal Connections

The goal of Canada's public passenger transportation system should be to provide a network of services that responds to needs at an affordable cost. Closer integration of all modes -- air, rail and bus -- would improve service to the public and enable each mode to take advantage of its particular strengths.

Closer integration could be achieved by linking air, rail and bus passenger terminal facilities in a central location in each city. The initiative could come from the federal and provincial governments working in conjunction with municipalities, airlines, railways and bus companies. Federal funds should be made available to implement joint terminal facilities. Since railway stations have historically been at the centre of city development, this program would typically involve upgrading central rail terminals.

Intermodal connections between bus and rail, in particular, could provide the following benefits: additional passengers for an improved rail system, opportunities for expansion of bus operations and a "door-to-door" service for patrons.

Marketing

A high-speed rail service would require further expenditure on marketing. VIA has announced some imaginative marketing plans and yet much more could be done. The "RESERVIA" system will link with Air Canada's reservation system and could possibly extend to other transportation modes and tourist operations to provide total tour packages.

Ontario would be prepared to lend its expertise in tourist promotion to VIA Rail to develop marketing programs which reflect this province's unique attractions. In addition, Ontario would be prepared to share in the cost of such marketing programs.

Cost of Improvements

The estimated cost of a first-step package of improvements to rail infrastructure in the Quebec-Windsor corridor is in the order of $250 million, which could provide 95 mph service throughout the corridor. Such improvements should be compatible with longer-range investment plans to achieve 125 mph service.

The keys to cost-effective upgrading are: investing in routes where the pay-off in increased passenger volumes will be the greatest; getting the most capacity out of existing infrastructure; and, rejecting "gold-plated" solutions in favour of practical, less costly approaches.

Basic improvements on other routes in the Quebec-Windsor corridor would include track upgrading, curvature reduction, improvements to the signalling system and grade separations. Without these infrastructure improvements, the new LRC equipment would be unable to sustain speeds of even 95 mph and trip times would remain substantially the same as achieved by conventional equipment.

Some improvements, such as closer intermodal connections, could be achieved through discussion rather than investment.

FINANCIAL AND ECONOMIC CONSIDERATIONS

Financing of CN

Since its formation in 1923, CN has had a history of losses. Only for the past two years have small profits been recorded.

In June 1978, the federal government moved to reduce CN's losses. Bill C-17 converted into equity $808 million in debt held by the government. This represents about 40 per cent of total debt and is expected to help turn CN's history of losses into profits.

In 1952, a similar recapitalization bill released CN from $736 million in debt, or 50 per cent of total debt. By 1976, CN's debt had risen to $2.2 billion.

Institutional Roles

An allied development to the recapitalization of CN, which will also serve to improve its profitability, is the creation of VIA Rail and the de facto transfer to VIA of the losses now sustained by the railways in the provision of passenger services.

The railways will provide passenger services on a contractual basis to VIA. In effect, 100 per cent of operating losses will be paid under the new system compared with 80 per cent under the old.

Five agencies are involved in providing passenger rail services - VIA, Transport Canada, CN, CP and the Canadian Transport Commission. With the creation of VIA, Transport Canada would appear to be in a position to sidestep, or at least to modify the powers of the CTC to some extent, through defining VIA's corporate and route objectives and through budgetary controls.

The federal government chose not to establish VIA through its own definitive legislation. In the absence of such definition, the Minister of Transport Canada has significant control over VIA Rail established not in legislation, but through contract. Partly as a result, the roles and responsibilities of the various agencies not only in providing passenger rail services but in determining what is to be provided at what cost, are complex and overlapping.

Intermodal Savings

Any economic assessment of a high-speed rail system in the Quebec-Windsor corridor should look beyond the balance sheet of the railways to include social benefits and accompanying cost savings on other modes.

There are several important investment decisions to be taken by Ontario and the federal government which have significant intermodal implications. Perhaps the most critical involve the question of additional airport capacity in the Toronto area. For example, there are ongoing discussions of the need for Pickering Airport and for commercial STOL services at Toronto Island Airport.

Although investment decisions in rail and air are related, these two modes are not simply alternatives. Because rail fares are generally lower than air fares over the same routes, rail improvements would benefit a wider cross-section of the travelling public. In addition, because rail can serve intermediate communities along its route, it would be accessible to a much larger population. There would be regional development benefits for intermediate communities, particularly in Eastern Ontario on the Toronto-Ottawa and Toronto-Montreal routes.

Job Creation

Investment in improved rail would create new jobs and could provide an alternative to federal expenditures on unproductive income maintenance programs. During the five years required to improve rail infrastructure to 95 mph service in the Quebec-Windsor corridor, about 1,200 jobs could be created in each year. Upgrading in other regions would create proportionately larger numbers of jobs.

These direct jobs would be in such areas as: upgrading track, curvature improvements, reballasting, signalling improvements and terminal improvements. Secondary jobs would be created in supplier industries, e.g., primary metals (rails, rail fasteners, tie plates and reinforcing bars), fabricated metals, electronics, as well as cement and concrete products.

Steel rail is produced in Canada by Sydney Steel Corporation (Sysco) of Halifax and The Algoma Steel Corporation Limited of Sault Ste. Marie. Sysco has historically had significant excess capacity but recently, due to large export orders, has begun to expand. In the past four years, only about eight per cent of Algoma's production has been in the form of rails. The company was one of the first in North America to produce rails by the new process of continuous casting. Any orders for new rail that resulted from rail improvement programs could be filled in Canada by Canadian-owned companies.

If further orders for LRC trains were to be triggered by improvements to infrastructure, additional jobs would be created in rolling stock and locomotive manufacturing industries, as well as in supplier industries, e.g., iron and steel, aluminum fabrication and glass.

Research and development to improve passenger rolling stock, especially in the area of suspension systems which can accommodate track imperfections, would spur export sales and further improve job prospects. Prime export markets would be: U.S.A., Australia and Portugal, as well as Latin American countries improving their stock of public capital, for example, Brazil, Cuba and Mexico.

Investment in Other Modes

Although substantial expenditure on rail improvements has been promised, Table 3 indicates that the federal government spends almost half its transportation funds on air. A cumulative total of the six fiscal years ending in 1975/76 shows that, during that period, 44 per cent was spent on air, 25 per cent on rail, 23 per cent on water and 8 per cent on road.

These expenditures do not differentiate between operating subsidies and capital investment. Most rail expenditures would have been to subsidize losses, while the bulk of air expenditures would have gone to increase capital stock.

Massive investment in road and rail is already in place in the Quebec-Windsor corridor. Highway 401, the road equivalent of the Quebec-Windsor rail corridor, would cost almost $1 billion to build at current rates. In addition, Ontario is making substantial investments in public transit. For 1978/79 alone, Ontario has allocated $162.9 million to assist municipalities.

By comparison to these past and ongoing investments, at both federal and provincial levels, a federal expenditure of $250 million over 5 years to improve the rail system in the Quebec-Windsor corridor is not a disproportionate investment in transportation in this corridor.

FEDERAL GROSS EXPENDITURE FOR TRANSPORTATION
(Thousands of Dollars)

Table 2

Trans-portation	1971/2	1972/3	1973/4	1974/5	1975/6	1976/7	Cumulative Total 1971/2-1976/7
Air	299,407	300,315	459,680	562,436	634,975	589,245	2,846,058 44%
Road	58,716	63,975	81,814	70,967	112,259	139,871	527,602 8%
Rail	103,139	154,656	251,095	406,097	384,732	405,462	1,705,181 26%
Water	182,782	191,111	220,048	252,479	268,946	312,008	1,427,374 22%
Total	644,044	710,057	1,012,637	1,291,979	1,400,912	1,446,586	6,506,215

Source: Statistics Canada, 68-211, Federal Government Finance.

CONSOLIDATED GOVERNMENT EXPENDITURE
(Fiscal Year Ended Nearest to December 31) ($000's)

Table 3

Transportation	1971	1972	1973	1974	1975
Air	300,173	300,945	465,144	572,095	655,743
Road	2,721,967	2,296,226	3,394,626	4,204,066	4,722,277
Rail	105,537	161,059	272,594	421,807	385,802
Water	233,504	250,495	300,455	392,837	416,450
Total	3,361,181	3,638,725	4,432,819	5,590,805	6,180,272

Source: Statistics Canada 68-202 - Consolidated Government Finance.

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